

Extreme Loading of Physical Infrastructure: *Integrated Design for Intelligent Resilience*

11 March 2010

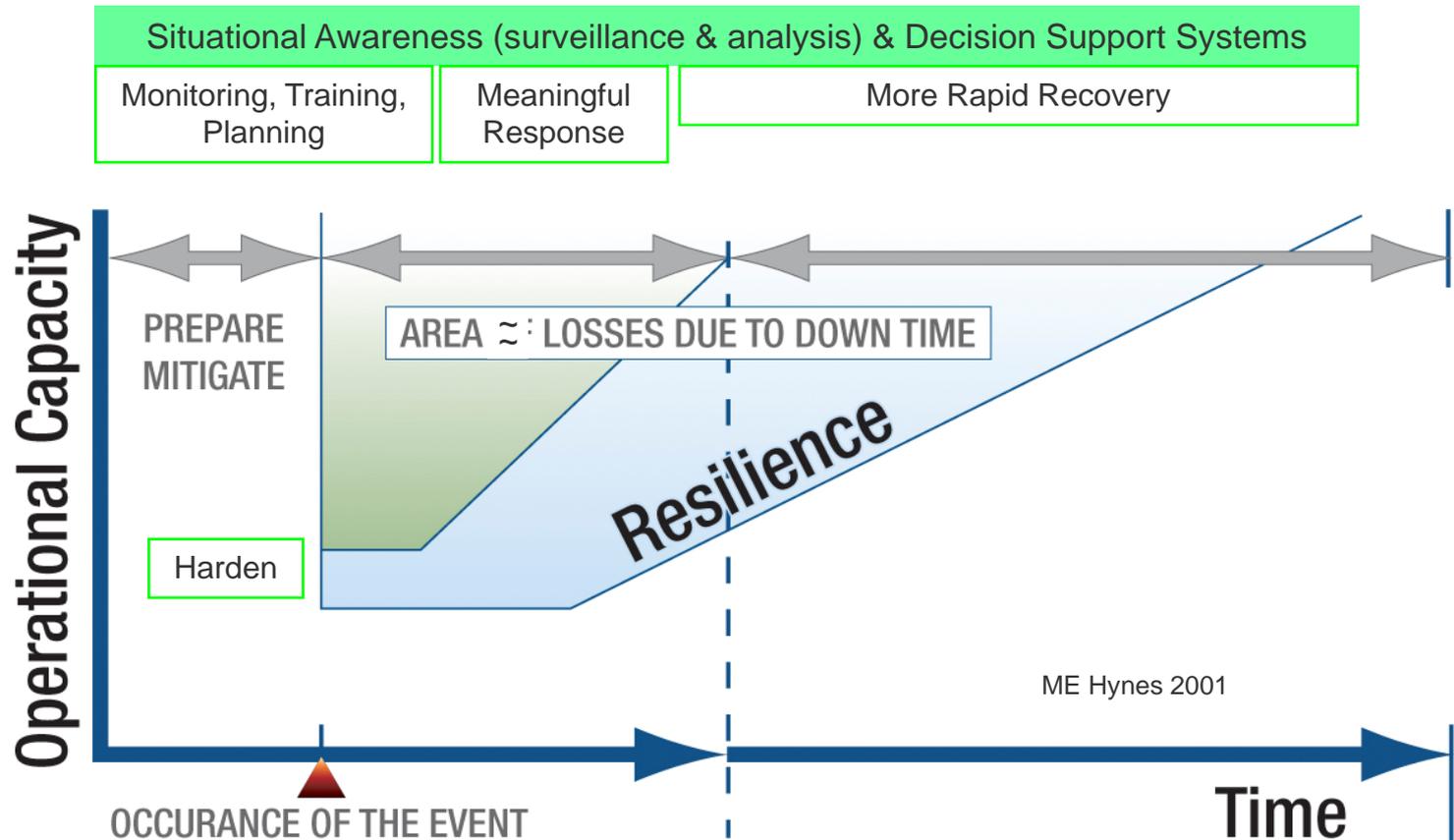
Fourth DHS University Network Summit

Dr. Mary Ellen Hynes, PE
Director of Research
Infrastructure and Geophysical Division
Science and Technology Directorate
Department of Homeland Security



Unifying Paradigm for “Resilience”

Infrastructure Protection means Continuity of Operations/Service



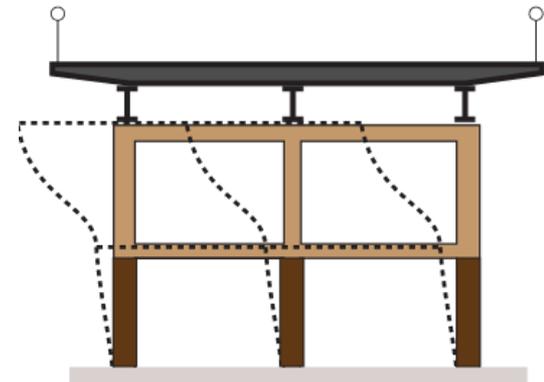
Homeland Security

Solution Criteria for success should be:

Practical, effective, affordable, sustainable, attractive to the market place

Main take-away messages

- **Resilience** diagram – Critical Infrastructure Protection means continuity of service
- **System testing** not just component testing
- **Advanced Materials and Integrated Design** with New Connections – entirely new materials, biomimicry
- **Complex interactions** like Soil-Structure-Water Interaction – Ports (seismic design deficiencies), Dams
- **Fire impact** on buildings, bridges, connections – thermal expansion and melting, explosions
- **Integrated, balanced design** with multiple objectives, sustainability – infrastructure of the future





Homeland
Security